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ABSTRACT

A survey of 400 randomly selected Florida vocational educators was conducted to determine their attitudes toward educational change and how flexible they are. The teachers received a three-part form which was intended to measure demographics, innovativeness-flexibility, and attitude toward innovation. Approximately 330 questionnaires were returned. The results of the survey showed that Florida vocational educators are favorable toward innovation and change as well as flexible. Results of this study also support the relationship between receptiveness to change and a favorable attitude toward innovation. An association between demographic characteristics and attitude toward innovation, flexibility, and innovativeness was supported by this research. Teachers who had more credits and who belonged to professional associations were more innovative. The research findings also determined an association between flexibility and change receptivity. Recommendations for further research efforts include a measure of the innovations teachers have implemented in order to show a relationship between the survey results and proof that the teachers are practicing innovators. Eleven tables and a reference list are included. (KC)

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CHARACTERISTICS OF FLORIDA VOCATIONAL EDUCATORS AND THEIR RECEPTIVITY TO AND ATTITUDE TOWARD EDUCATIONAL CHANGE AND INNOVATION

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Introduction

Significance of the Study. Implications of the need for educational change are prevalent in the literature. For example, Finn (1981) comments, "American education today is the object of nationwide discontent" (p. 82). Educational authorities agree that changes in education are needed; however, they conclude that schools are traditionally conservative and are slow to respond to needed revisions (Alexander, 1967; Brickell, 1967; Evans & Lipperman, 1968; Havelock, 1970; Heathers, 1974; Jwaideh & Bhola, 1974; Miles, 1964; Mort, 1964; Radcliffe, 1967; Rogers & Shoemaker, 1971; Wilkie, 1967). Educational reform has become an important and controversial issue. The recent attention to educational quality has stimulated a renewed commitment on the part of all involved in the educational process.

It has been concluded that because of the frequency of, and the necessity for, change information is needed concerning where teachers are in the change process in terms of both their feelings and their behaviors before effective change strategies can be implemented (Button, 1973; Loucks & Hall, 1977). Attitude has been identified as an indicator of receptivity to change; with the major source of resistance to change lying in the attitude of the individual (Shaw & Wright, 1967).

Research Questions. This study was designed to answer the following research questions:

1. Do Florida vocational educators in various demographic categories differ in their attitudes toward innovation, their tendency to be flexible, and their tendency to be innovative?

2. Are certain demographic factors; i.e., sex, age, teaching/service area, type of school, degree held, inservice training hours earned, college credit hours earned, teaching experience, and professional affiliation memberships predictive of the attitude of Florida vocational educators toward innovation, their tendency to be innovative?

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3. Is there a relationship between the attitude of Florida vocational educators toward innovation and their tendency to be innovative and flexible?

4. Is there a relationship between the tendency of Florida vocational educators to be flexible and their tendency to be inovative?

5. Is there a relationship between the demographic characteristics of Florida vocational educators?

Methodology

Introduction. The objectives of this study were accomplished through the administration of a three-part questionnaire. The instrument was mailed to a stratified random sample of Florida vocational educators representing all vocational service areas. Several statistical techniques were used to analyze the data. Specifically, a one-way analysis of variance was used to determine any differences in educators' attitude toward innovation, flexibility, and innovativeness; regression was used to determine the predictiveness of demographics on the variables of attitude toward innovation, flexibility, and innovativeness; also a Pearson Product Moment Correlation analysis was used to determine the relationship between variables.

Instrumentation. The survey instrument used to accomplish the objectives of this research consisted of three parts; i.e., part I, a demographic information instrument which was developed by this researcher; part II, the Innovativeness-Flexibility Scale which was developed by Harrington (1976), the reliability coefficient was estimated to be .82 on this measure; and part III, an attitude toward innovation scale which was developed originally by the Kettering-Colgate Project staff (Schlesser, Crowley, Jenkins, Baumbach, Monihan, & Rudy, 1971) and revised by this researcher, the reliability coefficient was estimated to be .83 on this measure.

Sample Information. It was not feasible to survey all vocational educators in Florida; consequently, this investigator located a satisfactory sampling formula for the regression analysis which required the largest sample. Using the formula provided by Milton (1983), it was determined that 400 Florida vocational educators would be surveyed. Specifically, 100 business and office, 20 agribusiness, 132 industrial arts, 52 health and public

service, 56 home economics, 16 marketing and distributive, and 24 diversified educators were surveyed. The stratified random sample was identified by the Florida Educators' Information Service which maintains a current data base on all Florida vocational educators. The following fomula was utilized to determine the minimum sample size required for a regression analysis.

Formula]

Multiple Regression Sample Size

$$n = k + 1 + \frac{t^2(1 - R^2)}{\Delta r^2}$$

where:

n = minimum sample size needed

k = number of variables in the final model

t^2 = (critical t)^2

R^2 = amount of variance explained

Δr^2 = change in R^2

(Milton, 1983, pp. 7-9)

Data Collection. After the sample was identified, a three-part questionnaire, a cover letter, and a pre-addressed, stamped return envelope was mailed to each prospective respondent. On the first wave, a total of 269 questionnaires were returned, this represented a 67 percent return rate. Those who did not respond within two weeks from the initial mailing date received a follow-up packet. The follow-up mailing stimulated an additional 67 responses. The initial mailing and follow-up effort resulted in a net return of 84 percent; however, three percent were unusable.

Data Analysis. One objective of the study was to determine the attitudes of Florida vocational educators toward innovation. This was done through the administration of the Attitude Toward Innovation Measure. A score of 5.5 or below was used as an indication of a favorable attitude toward innovation.

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A second objective of the study was to identify vocational educators who are innovative and flexible. This was accomplished through the administration of the Innovativeness-Flexibility Scale. In order to tabulate the data on this segment of the instrument, a Likert-like scale was employed. Vocational educators who scored 35 or above on the first 14 items were classified as innovative and receptive to change; those who scored 15 or above on the remaining six item were classified as flexible.

A third objective of this research was to determine the relationship between demographic factors which are most commonly associated with those vocational educators who are most likely to be innovative, flexible, and favorable toward innovation. This was accomplished through the administration of the demographic segment of the instrument and the Innovativeness-Flexibility Scale.

The statistical techniques that were employed to test the hypotheses statements were: analysis of variance (ANOVA), multiple regression, and correlation analysis. An alpha level of .05 was utilized for all statistical tests. In addition, descriptive statistics were applied for the purpose of reporting respondent demographic data.

Specifically, the analysis of variance technique was used to assess the relative effect of one of the independent variables (demographic variables; i.e., sex, teaching/service area, type of school, and degree held) upon a dependent variable; i.e., flexibility, innovativeness, and attitude toward innovation. The independent variables were divided into categories and a mean was computed for each by utilizing one dependent variable at a time. The difference between means was then tested for statistical significance at the .05 alpha level. In addition, to test the strength of the difference between group means, a Newman-Keuls multiple range test was performed on the ANOVA results that revealed significant differences between group means.

A Pearson Product Moment Correlation statistic was computed to determine the relationship between each of the variables; i.e., attitude toward innovation, flexibility, and innovativeness and each of the interval variables; i.e., age, inservice and college credit earned, teaching experience and professional organization memberships.

Multiple regression analysis was used to assess the relationships among the independent variables (demographics) and a single dependent variable; i.e.,

flexibility, innovativeness, and attitude toward innovation. This technique was used to determine the predictiveness of the independent variables for the dependent variable scores.

The Pearson Product Moment Correlation coefficient statistic provided the measurement of relationship between the variables of flexibility, innovativeness, and attitude toward innovation. For example, this static enabled the researcher to predict the score on one variable based on the score of another. The lapha level of .05 for a two-tailed test was used to determine the significance level of the correlation (critical value). The Pearson Product Moment Correlation statistical test provided the measurement of relationship between the demographic (interval) variables under consideration; i.e., age, inservice, college credit and inservice hours earned, teaching experience, and professional organization memberships. Again, the alpha level of .05 for a two-tailed test was used to determine the significance level of the correlation (critical value).

Results

Instrument Reliability. Reliability measures were computed on various combinations of the three subscales which comprised Part II of the survey instrument. The reliability of all items on Part II of the survey instrument was estimated to be .82. The reliability for items 1-5 was estimated to be .68; .70 was the estimated reliability on items 6-14; and the reliability for items 15-20 was estimated to be .59. In addition, for items 1-14, the reliability estimate was .78.

While analyzing individual item contributions to the total instrument reliability estimate, it was found that the omission of two items would increase the alpha level considerably. These two items were worded in positive rather than negative terms. It is possible that the respondents did not read these items carefully enough to make the shift from negative to positive when these items were addressed.

Analysis of Data. The purpose of this study was to determine the attitude of Florida vocational educators toward innovation and change in the school environment. In addition, the study was designed to identify demographic characteristics and professional attributes associated with vocational educators who are flexible, innovative, and favorable toward innovation. The data obtained from the survey instrument were utilized to test thirteen hypotheses statements. A presentation of these statements and findings is contained in the following sections.

Hypothesis 1. This null hypothesis states that there is no difference among Florida vocational educators representing various service/teaching areas regarding attitude toward innovation for each of the demographic variables under consideration; i.e., sex, teaching/service area, type of school and degree held. A one-way analysis of variance (ANOVA) was calculated on the respondent data to determine whether there is a difference among the means of the eight teaching groups regarding attitude toward innovation. The analysis indicated that there was a statistically significant difference ($F=3.53$; $df=7, 316$; $p=<.001$) in the average attitude scores of the eight groups under consideration. This finding implies that there is a difference among the average scores of Florida vocational educators on the Attitude Toward Innovation scale (ATI). Even though all eight groups scored, on the average, below 5.5 on the ATI which is in the favorable range; some groups indicated a more favorable attitude than others. Individual scores on the ATI ranged from a low of 1.5 to a high of 9.7 with a mean score of 4.3. Table 1 presents the ANOVA summary table for Attitude Toward Innovation scores.

Table 1

ANOVA Summary Table for Attitude Toward Innovation Scores

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance
Teaching Area					
Between	85.5	7	12.2	3.53	<.001*
Within	1092.6	316	3.5		
Total	1178.1	323			
Sex					
Between	27.6	1	27.6	7.73	.01*
Within	1150.5	322	3.6		
Total	1178.1	323			
Degree					
Between	16.4	4	4.1	1.12	.35
Within	1161.7	319	3.6		
Total	1178.1	323			
Level Taught					
Between	18.6	3	6.1	1.71	.17
Within	1159.5	320	3.6		
Total	1178.1	323			

*=Significant at the .05 alpha level

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A Newman-Keuls test revealed that there is a contrast between the group means of home economics teachers with a mean of 3.53 which was the most favorable and diversified occupations teachers with a mean of 5.32 which was the least favorable. The Newman-Keuls test results are presented in Table 2.

Table 2

Newman-Keuls Test Results for Attitude Toward Innovation Scores

Group	Mean	F	Significance
Teaching Area		3.53	<.001
Business Education	4.49		
Diversified Occupations	5.32*♦		
Health and Public Service	4.10		
Industrial Education	3.92*♦		
Agribusiness and Natural Resources	4.12		
Marketing and Distributive Education	4.74		
Home Economics	3.53*♦		
Industrial Arts	5.06		
Sex		7.73	.01
Male	4.59*		
Female	4.00*		
Degree		1.12	.35
< Bachelor's	3.93		
Bachelor's	4.51		
Master's	4.13		
Advanced Master's	4.37		
Doctorate	4.71		
Level Taught		1.71	.17
High School	4.53		
Community College	4.10		
Vocational Center	3.93		
Middle School	4.26		

*=Contrast between means significant at the .05 alpha level.

♦=Contrast between diversified occupations and home economics means and between diversified occupations and industrial education means is significant at the .05 alpha level

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In addition, an ANOVA was run for each of the independent variables; i.e. sex, highest degree held, and level taught to determine whether there was a difference among the levels within these variables on the ATI. It was found that male and female respondents reported favorable scores; however, the ANOVA test determined that the difference between the mean scores of these two groups were significantly different ($F=7.33$; $df=1, 322$; $p=.01$). It was further revealed that female respondents scored more favorably with a mean score of 4.00 than male respondents with a mean score of 4.59. Even though all groups of respondents scored in the favorable range, it was indicated that neither the levels within the highest degree variable nor the factors within the teaching level variable reported mean scores that were significantly different on the ATI ($F=1.12$; $df=4, 319$; $p=.35$; and, $F=1.71$; $df=3, 320$; $p=.17$, respectively). Table 1 presents the ANOVA summary table for ATI scores. Based on the ANOVA test results, this null hypothesis is rejected at the .05 alpha level.

Hypothesis 2. There is no relationship between attitude toward innovation and age, inservice and college credit hours earned, teaching experience, or professional affiliation memberships, so states this null hypothesis. A Pearson Product Moment Correlation statistic (PPMC) was computed to determine whether there was a correlation between these demographic variables and the ATI. Specifically, it was discovered that the scores on the ATI have a significant negative relationship to the number of inservice hours earned during the past year by the respondent ($r=-.15$, $df=322$, $p=.006$). Specifically, the higher the number of inservice hours earned, the more favorable the corresponding ATI score. It was also determined that the respondent's number of professional organization memberships is negatively associated with ATI scores ($r=-.12$, $df=321$, $p=.027$); this result means that the more professional organizations the individual is a member of, the more favorable (lower) the ATI score can be expected to be. No relationship was found between ATI scores and age, college credit hours, or teaching experience. Based on the results of the PPMC tests, this null hypothesis is rejected at the .05 alpha level for a two-tailed test for significance. Table 3 presents the PPMC test results.

Table 3

Pearson's Product Moment Correlation Results

	Age	Inservice	College Credit	Professional Memberships	Teaching Experience	ATI	Flexibility	Innovativeness	Total
Age		-.057 p=.307	-.129 p=.024*	.134 p=.016*	.545 p=.001*	-.079 p=.156	-.051 p=.360	-.082 p=.141	-.080 p=.150
Inservice			.041 p=.469	.103 p=.064	-.066 p=.240	-.151 p=.006*	.040 p=.478	.035 p=.526	-.041 p=.469
College Credit				.009 p=.876	-.148 p=.009*	-.036 p=.534	.048 p=.405	.017 p=.763	.029 p=.608
Professional Memberships					.249 p=.001*	-.123 p=.027*	.103 p=.065	.145 p=.009*	.146 p=.009*
Teaching Experience						.060 p=.282	.027 p=.632	.026 p=.635	.029 p=.600
ATI							-.231 p=.001*	-.110 p=.048*	-.162 p=.003*
Flexibility								.571 p=.001*	.775 p=.001*
Innovativeness									.961 p=.001*
Total									

*=Significant at the .05 alpha level for a two-tailed test.

Hypothesis 3. This null hypothesis states that there is no difference among Florida vocational educators regarding the tendency to be flexible for each of the demographic variables under consideration; i.e., sex, teaching/service area, type of school, and degree held. A one-way analysis of variance was computed on the respondent data to determine whether there is a difference among the eight teaching groups regarding flexibility. The analysis indicated that there is a statistically significant ($F=2.18$; $df=7, 315$; $p=.04$) difference among the average flexibility scores of the eight groups under study. Individual flexibility scores ranged from a minimum of 11 to a maximum of 24 with a mean score of 16.5. All eight groups scored in the flexible range, specifically, 15 or above. In particular, health and public service teachers scored the most flexible with a mean of 17.25, while marketing and distributive education teachers scored the lowest of the eight groups with a mean score of 15.25 on the flexibility measure. Table 4 presents the ANOVA test results for flexibility scores.

Table 4

ANOVA Summary Table for Flexibility Scores

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance
Teaching Area					
Between	65.0	7	9.3	2.18	.04*
Within	1343.7	315	4.3		
Total	1408.7	322			
Sex					
Between	35.8	1	35.8	8.36	<.001*
Within	1373.0	321	4.8		
Total	1408.7	322			
Degree					
Between	45.7	4	11.4	2.67	.03*
Within	1363.0	318	4.3		
Total	1408.7	322			
Level Taught					
Between	55.0	3	18.3	4.32	.01*
Within	1353.8	319	4.2		
Total	1408.7	322			

*=Significant at the .05 alpha level.

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The Newman-Keuls post hoc test revealed that the contrast between the mean flexibility scores of marketing and distributive education teachers and health and public service teachers are significant at the .05 alpha level. Table 5 presents the results of the Newman-Keuls test for flexibility scores.

Table 5

Newman-Keuls Test Results for Flexibility Scores

Group	Mean	F	Significance
Teaching Area		2.18	.04
Business Education	16.56		
Diversified Occupations	16.68		
Health and Public Service	17.25*		
Industrial Education	16.23		
Agribusiness and Natural Resources	16.27		
Marketing and Distributive Education	15.25*		
Home Economics	16.78		
Industrial Arts	16.09		
Sex		8.36	<.001
Male	16.16*		
Female	16.83*		
Degree		2.67	.03
< Bachelor's	15.83*		
Bachelor's	16.30		
Master's	16.72		
Advanced Master's	17.11		
Doctorate	17.27*		
Level Taught		4.32	.01
High School	16.18*		
Community College	17.28*		
Vocational Center	16.30		
Middle School	16.73		

*=Contrast between means significant at the .05 alpha level

Also, ANOVA's were calculated to analyze the difference between flexibility mean scores for each of the independent variables; i.e., sex, level taught, and highest degree held. Even though all respondent groups scored in the flexible range, the analysis indicated that there is a significant difference in the flexibility scores of the

respondents. In particular, it was found that both males and females scored in the flexible range. The ANOVA test revealed a statistically significant difference ($F=8.36$; $df=1, 321$; $p=<.001$) between the two groups with female respondents being the more flexible.

The factors within the level taught variable were found to be statistically different ($F=4.32$; $df=3, 319$; $p=.01$) on flexibility with the community college teachers with a mean of 17.28 were the most flexible and high school teachers with a mean of 16.18 the least flexible. The Newman-Keuls test revealed that the contrast between the community college group mean and the high school group mean to be statistically significant at the .05 alpha level.

It was also determined that the factors within the highest degree held variable were found to be statistically different ($F=2.67$; $df=4, 318$; $p=.03$) on flexibility. Those with doctorates reported a mean of 17.28 were the most flexible and teachers with less than a bachelor's degree reported a mean of 15.83 were the least flexible. The Newman-Keuls test revealed that the contrast between the means of these two groups was significant at the .05 alpha level. Based on the results of the ANOVA tests, this null hypothesis is rejected at the .05 alpha level. The ANOVA summary table for flexibility scores is presented in Table 4; the corresponding Newman-Keuls post hoc test results are presented in Table 5.

Hypothesis 4. This hypothesis states that there is no relationship between the tendency to be flexible and age, inservice and college credit hours earned, teaching experience, or professional affiliation memberships. By computing a Pearson Product Moment Correlation it was determined that no relationships exist between flexibility and certain demographic variables, i.e., age, inservice and college credit hours earned, teaching experience, and professional organization memberships. Consequently, this null hypothesis is not rejected at the .05 alpha level. The PPMC results are presented in Table 3.

Hypothesis 5. There is no difference among Florida vocational educators regarding the tendency to be innovative for each of the demographic variables under consideration, thus states this null hypothesis. Again, a one-way analysis of variance was computed on the respondent data to determine whether there is a difference among the teaching groups regarding innovativeness. Although all groups, with the exception of industrial arts, scored in the innovative range; i.e., a score of more than 35; the

analysis indicated that there is a statistically significant difference ($F=4.68$; $df=7, 316$; $p<.001$). Individual innovativeness scores ranged from a low of 22 to a high of 54 with a mean score of 37. In particular, health and public service teachers appeared to be the most innovative of the eight groups with a mean of 39.95; whereas, the industrial arts group ($\bar{X}=34$) did not meet the minimum criterion for innovativeness which was a score of 35. The ANOVA summary table for innovativeness scores is presented in Table 6.

Table 6

ANOVA Summary Table for Innovativeness Scores

Source	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance
Teaching Area					
Between	696.1	7	99.4	4.68	<.001*
Within	6713.6	316	21.2		
Total	7409.6	323			
Sex					
Between	252.4	1	252.4	11.36	<.001*
Within	7157.2	322	22.2		
Total	7409.6	323			
Degree					
Between	508.1	4	127.0	5.87	<.001*
Within	6901.6	319	21.6		
Total	7409.6	323			
Level Taugnt					
Between	532.7	3	177.6	3.53	<.001*
Within	6877.0	320	21.5		
Total	7409.6	323			

*=Significant at the .05 alpha level.

The Newman-Keuls post hoc test revealed that the contrast between the mean innovativeness score of industrial arts instructors ($\bar{X}=34.33$) and health and public service teachers ($\bar{X}=39.95$) and the mean score of public service teachers ($\bar{X}=39.95$) and industrial education teachers

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($\bar{X}$=36.10) are significant at the .05 alpha level. Table 7 presents the Newman-Keuls test results for innovativeness scores.

Table 7

Newman-Keuls Test Results for Innovativeness Scores

Group	Mean	F	Significance
Teaching Area		4.68	<.001
Business Education	37.41		
Diversified Occupations	37.37		
Health and Public Service	39.95*♦		
Industrial Education	36.10*♦		
Agribusiness and Natural Resources	37.00		
Marketing and Distributive Education	36.25		
Home Economics	37.31		
Industrial Arts	34.33*♦		
Sex		11.36	<.001
Male	36.19*		
Female	37.95*		
Degree		5.87	<.001
< Bachelor's	35.18*		
Bachelor's	36.21		
Master's	37.95		
Advanced Master's	38.48		
Doctorate	40.45*		
Level Taught		8.36	<.001
High School	36.36*♦		
Community College	39.75*♦		
Vocational Center	36.79		
Middle School	35.80*♦		

*=Contrast between means significant at the .05 alpha level

♦=Contrast between health and public service and industrial education means and between health and public service and industrial arts means significant at the .05 alpha level

♦=Contrast between community college and high school means and between community college and middle school means significant at the .05 alpha level

ANOVA's were computed on the innovativeness variable to analyze the difference between the mean scores for each of the variables; i.e., sex, level taught, and highest degree held. Even though all respondent groups scored in the

innovative range; the tests conducted at the .05 alpha level revealed that sex, level taught, and highest degree held had statistically different innovativeness scores. The ANOVA revealed a statistically significant difference ($F=11.36$; $df=1,322$; $p=<.001$) between the groups with female respondents ($\bar{X}=37.95$) more innovative than male respondents ($\bar{X}=36.19$).

The factors within the level taught variable were found to be statistically different ($F=8.36$; $df=3, 320$; $p=<.001$) on innovativeness. The community college instructors had the most innovative mean score which was 39.75 and the middle school group had the least innovative mean score which was 35.80. The Newman-Keuls test determined that the contrast between these two mean scores were statistically significant at the .05 alpha level.

It was also determined by an ANOVA that the factors within the highest degree held variable were found to be statistically different ($F=5.87$; $df=4, 319$; $p=<.001$) on innovativeness. Those with doctorates reported a mean of 40.45 which was the most innovative; where as, those teachers with less than bachelor's degrees reported a mean score of 35.18 which was the least innovative. The Newman-Keuls test revealed that the contrast between these two group means was significant at the .05 alpha level. Based on the results of the ANOVA tests, this hypothesis is rejected at the .05 alpha level. The results of the ANOVA tests for innovativeness scores are presented in Table 6; the Newman-Keuls test results are summarized in Table 7.

Hypothesis 6. There is no relationship between their tendency to be innovative and age, inservice and college credit hours earned, teaching experience, or professional affiliation memberships, states this hypothesis. A Pearson Product Moment Correlation was calculated to determine the relationships between innovativeness and demographic variables; i.e., age, inservice and college credit hours earned, teaching experience, and memberships in professional organizations. Namely, memberships in professional organizations is positively associated with innovativeness ($r=.15$, $df=321$, $p=.009$). This result can be interpreted to mean that the more professional organizations the individual belongs to, the more likely the individual is to have a high innovativeness score. However, none of the other variables were found to be related to innovativeness. Thus, this hypothesis is rejected at the .05 alpha level. The results of the PPMC are presented in Table 3.

Hypothesis 7. This hypothesis states that demographic characteristics of Florida vocational educators are not predictive of their attitude toward innovation. Multiple regression analysis was used to determine if demographic factors can be used to predict the scores of vocational educators on the ATI measure. The criterion for statistical significance was an alpha level of .05 or an F larger than the corresponding critical F.

Overall, nine demographic variables were used in the analysis. The conceptual variables included in the analysis were: sex, age, teaching/service area, type of school, degree held, inservice hours taken and college semester hours earned during the past year, years of teaching experience, as well as professional organization memberships. Because regression assumes interval independent variables, special provisions for the inclusion of nominal conceptual variables were made through the use of dummy variables. This was done so that all the conceptual variables could be included in the regression equation. It was established that these particular nine demographic variables are useful in predicting scores on the ATI ($F=2.32$; $df=20, 281$; $p=<.001$); these variables also accounted for 14 percent of the variance explained by the model; hence, this null hypothesis is rejected.

In addition it was found that the professional organization membership variable was the only individual variable found to be a statistically significant predictor of ATI scores ($F=5.17$; $df=1, 281$; $p=.024$). Table 8 presents the multiple regression results for the ATI measure.

Table 8

Multiple Regression Analysis Results for the Attitude Toward Innovation Measure

Variable	F	Degrees of Freedom	Significance
Sex	2.19	1, 281	>.05
Age	2.18	1, 281	>.05
Teaching Area	1.70	7, 281	>.05
School Type	.19	3, 281	>.05
Degree	1.07	4, 281	>.05
Inservice	3.37	1, 281	>.05
College Credit	.15	1, 281	>.05
Teaching Experience	1.80	1, 281	>.05
Professional Memberships	5.17	1, 281	<.05*
TOTAL	2.32	20, 281	<.05*

R^2=.14
*=Significant at the .05 alpha level

Hypothesis 8. This null hypothesis states that demographic characteristics of Florida vocational educators are not predictive of the tendency to be flexible. Multiple regression analysis was used to determine whether the demographic factors under consideration can actually serve to predict flexibility scores. The regression analysis was conducted using the sum of items 15-20 on part II of the survey instrument which was predetermined to be a measure of flexibility. The criterion for statistical significance was an alpha level of .05. or an F larger than the corresponding critical F.

The nine demographic variables used in the analysis were: sex, age, teaching/service area, type of school, degree held, inservice hours taken and college semester hours earned during the past year, years of teaching experience, as well as professional organization memberships. Because regression assumes interval independent variables, special provisions for the inclusion of the nominal conceptual variables were made through the use of dummy variables. This was done so all the conceptual variables could be included in the regression equation. It was confirmed by the regression analysis that these particular nine demographic variables are useful in predicting flexibility scores ($F=1.75$; $df=20, 281$; $p=.026$). These variables accounted for 11 percent of the variance explained by the model; therefore, this null hypothesis is rejected.

In addition, it was established through regression analysis that the professional organization membership variable was the only individual variable found to be a statistically significant predictor of flexibility scores

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(F=1.54; df=1, 281; p<.05). Table 9 presents the multiple regression analysis results for the flexibility measure.

Table 9

Multiple Regression Analysis Results for the Flexibility Measure

Variable	F	Degrees of Freedom	Significance
Sex	.42	1, 281	>.05
Age	1.95	1, 281	>.05
Teaching Area	1.35	7, 281	>.05
School Type	.61	3, 281	>.05
Degree	1.38	4, 281	>.05
Inservice	.08	1, 281	>.05
College Credit	.06	1, 281	>.05
Teaching Experience	.07	1, 281	>.05
Professional Memberships	1.54	1, 281	<.05*
TOTAL	1.75	20, 281	<.05*

R^2=.11
*=Significant at the .05 alpha level

Hypothesis 9. This null hypothesis states that demographic characteristics of Florida vocational educators are not predictive of the tendency to be innovative. Multiple regression analysis was used to determine whether demographic variables can be used to predict the innovativeness scores of Florida vocational educators. The regression analysis was conducted on the sum of items 1-14 on part II of the survey instrument which was predetermined

to be a measure of innovativeness. The criterion for statistical significance included an alpha level .05 or an F larger than the corresponding critical F.

Nine demographic variables used in the analysis included: sex, age, teaching/service area, type of school, degree held, inservice hours taken and college semester hours earned during the past year, years of teaching experience, as well as professional organization memberships. Because regression assumes interval independent variables, special provisions for the inclusion of nominal conceptual variables were made through the use of dummy variables. This was done so that all of the conceptual variables could be included in the regression equation. It was verified by the regression analysis that these particular nine variables are useful in predicting innovativeness scores ($F=2.88$; $df=20, 281$; $p<.001$); these variables also accounted for 17 percent of the variance explained by the model; consequently, this null hypothesis is rejected.

In addition, the regression analysis revealed that the highest degree held variable was the only individual variable found to be a statistically significant predictor of innovativeness scores ($F=3.71$; $df=4, 281$; $p=<.001$) and this variable alone accounted for 4 percent of the variance explained by the model. These multiple regression findings for the innovativeness measure are presented in Table 10.

Table 10

Multiple Regression Analysis Results for the Innovativeness Measure

Variable	F	Degrees of Freedom	Significance
Sex	.01	1, 281	>.05
Age	1.24	1, 281	>.05
Teaching Area	1.64	7, 281	>.05
School Type	.94	3, 281	>.05
Degree	3.71	4, 281	<.05*
Inservice	.81	1, 281	>.05
College Credit	.03	1, 281	>.05
Teaching Experience	<.01	1, 281	>.05
Professional Memberships	1.05	1, 281	>.05
TOTAL	2.88	20, 281	<.05*

$R^2=.17$
*=Significant at the .05 alpha level
Degree accounted for 4 percent of the variance explained

A regression analysis was performed utilizing the Innovativeness-Flexibility Scale. This scale embodies the flexibility measure and the innovativeness measure; specifically, this scale includes items 1-20 on part II of the questionnaire. It was revealed by the analysis that the nine particular variables under consideration in this study are useful in predicting scores on the Innovativeness-Flexibility Scale ($F=2.86$; $df=20, 281$; $p=<.001$); the nine variables also accounted for 17 percent of the variance explained by the model. Considered individually, however, degree was the only individual variable found to be a significant predictor of Innovativeness-Flexibility scores ($F=4.77$; $df=4, 281$; $p=<.001$). Table 11 presents the multiple regression analysis results for the Innovativeness-Flexibility scale.

Table 11

Multiple Regression Analysis Results for the Innovativeness-Flexibility Scale

Variable	F	Degrees of Freedom	Significance
Sex	.10	1, 281	>.05
Age	1.81	1, 281	>.05
Teaching Area	1.69	7, 281	>.05
School Type	.52	3, 281	>.05
Degree	4.77	4, 281	<.05*
Inservice	.62	1, 281	>.05
College Credit	.05	1, 281	>.05
Teaching Experience	.02	1, 281	>.05
Professional Memberships	1.49	1, 281	>.05
TOTAL	2.86	20, 281	<.05*

$R^2=.17$
*=Significant at the .05 alpha level
Degree accounted for 4 percent of the variance explained

Hypothesis 10. There is no relationship between the attitude toward innovation of Florida vocational educators and the tendency to be flexible; thus states this null hypothesis. A Pearson Product Moment Correlation was computed to determine whether there is a relationship between a vocational educator's ATI and flexibility scores. It was determined that there is a negative association between the two scores ($r=-.23$, $df=321$, $p=<.001$). Consequently, this null hypothesis is rejected at the .05 alpha level utilizing a two-tailed test for significance. This means that a favorable attitude score on the ATI is indicative of a flexible score on the flexibility measure or vice versa. Table 3 presents a summary of the PPMC test results.

Hypothesis 11. This hypothesis states that there is no relationship between the attitude toward innovation of Florida vocational educators and the tendency to be innovative. A Pearson Product Moment Correlation was calculated to determine whether there is a relationship between a vocational educator's ATI and innovativeness scores. It was established that there is a negative relationship between the two scores ($r=-.11$, $df=322$, $p=.048$); thus, this null hypothesis is rejected at the .05 alpha level utilizing a two-tailed test for significance. This can be interpreted to mean that a high score on the ATI is indicative of a low score on the innovativeness measure and vice versa. This results of the PPMC tests are presented in Table 3.

Hypothesis 12. This null hypothesis states that there is no relationship between the tendency of Florida vocational educators to be flexible and their tendency to be innovative. It was determined by a PPMC test that flexibility scores and innovativeness scores are positively related ($r=.57$, $df=321$, $p=<.001$). Thus, this null hypothesis is rejected at the .05 alpha level for a two-tailed test for significance. This result can be interpreted to mean that if a high (flexible) score on the flexibility measure is obtained; a high (innovative) score can be expected on the innovativeness measure and vice versa. Table 3 presents the PPMC results.

Hypothesis 13. This hypothesis states that there are no relationships between the demographics characteristics; i.e., age, inservice and college credit hours earned, teaching experience, and professional affiliation memberships of Florida vocational educators. Several Pearson Product Moment Correlations were computed to determine whether there are any relationships between certain demographic variables; i.e., age, inservice hours earned during the past year, college credit earned during the past year, teaching experience, and professional organization memberships. Specifically, age was confirmed to be positively associated with teaching experience and memberships in professional organizations ($r=.25$, $df=321$, $p=<.001$; $r=.13$, $df=321$, $p=.02$, respectively); whereas, age and teaching experience were found to be negatively related to college credit hours earned during the past year ($r=-.15$, $df=307$, $p=.009$; $r=-.13$, $df=307$, $p=.02$, respectively). A positive association implies that if one variable increases so does the other. For example as age increases so does memberships in professional organizations as well as years of teaching experience. On the other hand, a negative association can be interpreted to mean an increase in one variable will imply a decrease in the other variable. In particular, as age or teaching experience increases, a decrease in college credit hours can be expected. Based on the PPMC results, this hypothesis is rejected at the .05 alpha level for a two-tailed test for significance. The PPMC findings are reported in Table 3.

Discussion, Conclusions, and Recommendations

Discussion. Results of this study supports the relationship between receptiveness to change and a favorable attitude toward innovation; thus, the conclusions of this research effort are in agreement with other research on innovation; e.g., Evans & Lipperman (1968), Harrington (1976), Harvey (1970), Havelock (1971), Hyer (1972), Nickse (1972), Rogers (1983), Shaw & Wright (1967), Stahl (1972). Also the findings of this research report support the findings of those who reported a relationship between flexibilbili and innovativeness (CERLI, 1969; Jenkins, 1967; Leas, 1965).

The results of this study also indicated that demographic characteristics are associated with attitude toward innovation, flexibility, and innovativeness. Specifically, the findings of this research supports Crowther's (1972) conclusion that there is no relationship between age and receptivity to change, but other researchers have reported high correlations between age and innovativeness; e.g., Beuke & Farrar (1969), Haven (1973), Hawkins (1968), Leas (1965), Lippitt et al. (1967), Marcum (1968), Rogers & Shoemaker (1971), Russell (1971), Spivey (1977), Watson (1981), Yegge (1971), Zimmerman (1970). Also, sex was found to be related to innovativeness (Anderson, 1975; Corwin, 1975; Zimmerman, 1970); moreover, they found males to be more innovative than females. However, this research indicated that female teachers are more innovative than male teachers.

This research did not support Slaugh's (1983) contention that vocational business education instructors who are employed in vocational centers are the most receptive to change as opposed to teachers who are employed at other levels in the public school system. This research revealed, however, that the community college instructor was the most innovative of the four groups under study; i.e., community colleges, high schools, vocational centers, and middle schools. In addition the results of this study support those investigators who are of the opinion that amount of education and innovativeness are positively related (Aiken & Hage, 1970; Brickell, 1967; Chesler, 1966; CERLI, 1969; Lippitt et al., 1967; Pénny, 1970; Rogers, 1963; 1983; Rogers & Shoemaker, 1971; Zimmerman, 1970).

The findings of this study also support the contention that innovativeness and teaching experience are not related (Archibald, 1980; Beckerman, 1971; Galler, 1970; Willsey, 1971; Wygal, 1966). Professional development (inservice or

college credit) was not found to be related to innovativeness; whereas, Doble (1978), Peterman (1966), and Slaugh (1983) did detect a relationship. Cosmopoliteness was measured was measured by the professional membership variable. This research supports the findings of other researchers who have concluded that there is a relationship between cospomopiteness and innovativeness (Aiken & Hage, 1970; Appel & Roueche, 1978; Carlson, 1964; Christiansen, 1965; Demos, 1978; Evans and Lipperman, 1968; Eichholz & Rogers, 1964; Havelock, 1971; Leas, 1965; Penny, 1970; Peterman, 1966; Rogers, 1963, 1983; Rogers & Shoemaker, 1971; Russell, 1975); in particular, the results of this study revealed an association beteen memberships in professional organizations and innovativeness.

Researchers have found educational level to be associated with innovativeness (Aiken & Hage, 1970; Brickell, 1967; Chesler, 1966; CERLI, 1969; Lippitt et al., 1967; Penny, 1970; Rogers, 1963, 1983; Rogers & Shoemaker, 1971; Zimmerman, 1970). The results of this study does not substantiate these previous conclusions, but the findings of this research support Harrington's (1976) contention that educational level and innovativeness are not related.

In addition, the overall contribution of the dmographic variables under consideration to innovativeness was found to be significant. However, the amount of variance attributed to these characteristics was modest at best. This is partially due to the multicolinearity of the dependent variables under consideration. Thus, it can be concluded that other factors contribute to innovativeness.

The research findings indicated an association between flexibility and change receptivity. This finding substantiates the conclusions of other investigators who have also found an association between these two variables (CERLI, 1969), Evans & Lipperman, 1968; Jenkins, 1967; Leas, 1965). Flexibility was found to be related to attitude toward innovation, however. Also, it was determined that the demographic variables under consideration can be used to predict flexibility scores; however, these variables accounted for such a modest amount of variance, it can be concluded that other factors contribute to flexibility.

Conclusions. Florida vocational educators were found to be favorable toward innovation and change as well as flexible. Results of this study also support the relationship between receptiveness to change and a favorable attitude toward innovation. Florida vocational

educators were found to be receptive to change with the exception of industrial arts instructors. An association between demographic characteristics and attitude toward innovation, flexibility, and innovativeness was supported by this research. The research findings also determined an association between flexibility and change receptivity. These results led to the following conclusions:

1. The Florida vocational teachers included in this study were found to be flexible, innovative, and favorable toward innovation. In particular, home economics teachers had the most favorable attitude toward innovation with health and public service teachers the most flexible and innovative.

2. Demographic variables were found to be associated with attitude toward innovation and innovativeness. Specifically, a relationship was found between attitude toward innovation and inservice hours earned and between attitude toward innovation and professional memberships. The results indicated that innovativeness and professional memberships are related.

3. Demographic characteristics were found to be indicative of attitude toward innovation, flexibility, and innovativeness; however, it was determined that the amount of variance explained by the demographic variables was modest at best.

4. It was revealed that favorable attitudes toward innovation are related to flexibility and innovativeness; also, flexibility and innovativeness are related.

Recommendations for Further Research. Throughout, this research has concentrated on the Florida vocational educators and his/her attitude toward innovation, predisposition toward change, and demographic characteristics. This research revealed that vocational educators are predisposed to change and innovation. However, a predisposition to change may be insufficient to affect the responsiveness and effectiveness of teachers regarding innovative practices. This study was delimited to the examination of positive and negative attitudinal responses of Florida vocational educators to innovation; the impact of environmental constraints was not addressed. Consequently, it is recommended that research be undertaken to determine what environmental deterrents impact attitude and change receptiveness.

The instruments utilized in this study can assist in the identification of innovative vocational educators. There is a need, however, for more accurate evaluation instruments. Specifically, additional research needs to be undertaken to substantiate the utility of the evaluation instruments used in this study. Perhaps the Attitude Toward Innovation Scale is more useful in determining attitudes regarding specific innovations rather than attitude toward innovation in a general context.

Demographic characteristics can be useful in predicting scores on evaluation instruments. However, demographic variables accounted for such a small percentage of the variance explained, it is concluded, therefore, that variables other than those investigated by this research, be used to predict scores on the instruments. It is recommended that further research be conducted to identify those factors which are predictive of innovativeness, flexibility, and attitude toward innovation.

It is recommended that future research efforts include a measure of the innovations the teacher has implemented. In particular, the relationship between the number of innovations implemented and scores on evaluation instruments. In other words, those instructors whose scores indicate they are innovative and receptive to change are, in reality practicing innovators.

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